

U.S. Appl. Ser. No. 10/066,004
Response Filed: September 18, 2005
Reply to Non-Final Office Action mailed March 18, 2005

Amendments to the Claims:

1. (Previously Presented) A computer assisted method comprising:
measuring activity of one or more internal voxels of a brain of a subject, wherein the measuring activity is performed by an apparatus comprising an fMRI;
employing computer executable logic that takes the measured brain activity and determines one or more members of the group consisting of: a) what next stimulus to communicate to the subject, b) what next behavior to instruct the subject to perform, c) when the subject is to be exposed to a next stimulus, d) when the subject is to perform a next behavior, e) one or more activity metrics computed from the measured activity, f) a spatial pattern computed from the measured activity, g) a location of a region of interest computed from the measured activity, h) performance targets that when the subject is to achieve computed from the measured activity, i) a performance measure of when the subject's success computed from the measured activity and, j) the subject's position relative to an activity measurement instrument; and
employing a computer to communicate information based on the one or more determinations to the subject in less than 10 seconds from when the activity is measured.
- 2-3. (Cancelled)
4. (Original) A method according to claim 1 wherein the determinations are made in less than 1 second relative to when the activity is measured.
5. (Original) A method according to claim 1 wherein the determinations are made in less than 0.5 second relative to when the activity is measured.
6. (Previously Presented) A method according to claim 1 wherein the information is determined while the apparatus used for measurement remains positioned about the subject.

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7. (Previously Presented) A method according to claim 1 wherein the apparatus is capable of taking measurements from one or more internal voxels without substantial contamination of measurements by activity from regions intervening between the internal voxels being measured and wherein the apparatus collects the activity measurements.
8. (Previously Presented) A method according to claim 1 wherein activity measurements are made from at least 100 separate internal voxels at a rate of at least once every five seconds.
9. (Previously Presented) A method according to claim 1 wherein activity measurements are made from a set of separate internal voxels corresponding to a scan volume including the entire brain.
10. (Previously Presented) A method according to claim 1 wherein the internal voxels have a total three dimensional volume of 5x5x5cm or less.
11. (Previously Presented) A method according to claim 1 wherein the internal voxels have a total three dimensional volume of 1x1x1cm or less.
12. (Original) A method according to claim 1 wherein the method further comprises selecting one or more of the internal voxels to correspond to a region of interest for the subject and using the selected internal voxels of the region of interest to make the one or more determinations.
13. (Previously Presented) A method according to claim 12 wherein the region of interest is selected from the group consisting of substantia nigra, subthalamic nucleus, nucleus accumbens, locus coeruleus, periaqueductal gray matter, nucleus raphe dorsalis, nucleus basalis of Meynert, dorsolateral pre-frontal cortex, and anterior pre-frontal cortex.
14. (Previously Presented) A method according to claim 12 wherein the region of interest has a primary function of releasing a neuromodulatory substance, where the neuromodulatory

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substance is selected from the group consisting of: dopamine, acetyl choline, noradrenaline, serotonin, and endogenous opiate.

15. (Previously Presented) A method according to claim 12 wherein the subject has one or more of the following conditions: Parkinson's disease, Alzheimer's disease, attention & attention deficit disorder, depression, substance abuse and addiction, or schizophrenia.

16. (Previously Presented) A method according to claim 1 wherein the information is communicated by a manner selected from the group consisting of providing audio to the subject, providing tactile stimuli to the subject, providing a smell to the subject, and displaying an image to the subject.

17. (Original) A method according to claim 1 wherein the information communicated is an instruction to the subject.

18. (Previously Presented) A method according to claim 17 wherein the instruction is a text or iconic indication denoting an action that and subject is to perform.

19. (Original) A method according to claim 17 wherein the instruction identifies a task to be performed by the subject.

20. (Previously Presented) A method according to claim 17 wherein the instruction is determined by the computer executable logic.

21. (Previously Amended) A method according to claim 20 wherein the instruction communicated is selected from a set of instructions stored in memory, wherein selection is based upon the activity measured.

22. (Original) A method according to claim 1 wherein some of the information communicated to the subject is material to be learned.

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23. (Previously Presented) A computer readable medium comprising a computer executable instruction for guiding brain activity training comprising:

logic which takes data corresponding to activity measurements of one or more internal voxels of a brain of a subject, wherein said activity measurements are performed by fMRI, and determines one or more members of the group consisting of: a) what next stimulus to communicate to the subject, b) what next behavior to instruct the subject to perform, c) when the subject is to be exposed to the next stimulus, d) when the subject is to perform a next behavior, e) one or more activity metrics computed from the measured activity, f) a spatial pattern computed from the measured activity, g) a location of a region of interest computed from the measured activity, h) performance targets that the subject is to achieve computed from the measured activity, i) a performance measure of the subject's success computed from the measured activity, and j) the subject's position relative to an activity measurement instrument; and

logic for communicating information based on the determinations to the subject in less than 10 seconds from when the activity is measured.

24. (Cancelled)

25. (Previously Presented) A method comprising:

(a) measuring activity of one or more internal voxels of a brain of a subject, wherein the measuring activity is performed by fMRI;

(b) communicating instructions to the subject derived from that measured activity in substantially real time relative to when the measuring activity, wherein the logic instructions are communicated to the subject by employing a computer executable medium; and

(c) having the subject perform a behavior in response to receiving the instructions.

26. (Cancelled)

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27. (Previously Presented) A method according to claim 25 wherein the measuring activity is made from at least 100 internal voxels.

28. (Previously Presented) A method according to claim 25 wherein the instructions are derived through a computer executable logic process of selecting from a set of possible instructions based upon the measured activity.

29. (Previously Presented) A method according to claim 28, wherein the computer executable logic is employed to cause the information to be communicated to the subject.

30. (Previously Presented) A computer readable medium comprising a computer executable instruction wherein the computer executable instruction comprises:

logic for taking activity measurements by a fMRI of one or more localized brain regions of a subject as a behavior is performed; and

logic for communicating information to the subject based on activity measurements in less than 10 seconds from when the behavior is performed;

wherein the logics take new activity measurements as they are received and communicate new information based on the new activity measurements.